



# SSC San Diego

Creating Integrated  
C4ISR Solutions



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## Creating Integrated C4ISR Solutions

*Our Nation's warfighters must have the tools necessary to achieve information dominance over all known and potential enemies. SSC San Diego creates integrated C4ISR solutions that are key to information dominance.*

The Space and Naval Warfare Systems Center, San Diego (SSC San Diego) is uniquely qualified to provide the expertise and tools to achieve information dominance. We are at the leading edge of technologies that support the processes of transforming data into information, information into knowledge, and knowledge into understanding.

Our great strength at SSC San Diego is our unique expertise across the full spectrum of C4ISR. Guided by our vision—to be the Nation's pre-eminent provider of integrated C4ISR solutions—our work ranges from basic research and prototype development through systems engineering and integration to life-cycle support of fielded systems. Major thrusts are directed toward merging advanced technology and systems into integrated C4ISR capabilities, supporting joint C4ISR needs of the military, and cooperating with industry.

While most of our work addresses Navy needs, we actively support Marine Corps, Air Force, Army, and Coast Guard programs as well as other government agencies in addressing their unique C4ISR requirements. The information technologies we provide to the warfighter also have applications in disaster relief, crisis response, emergency management, and other civilian operations where dynamic communications, collaboration, and situation understanding are essential to protecting lives and property.

SSC San Diego's facilities, laboratories, and fleet communications capabilities allow our engineers and scientists to



### Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR)

Effective C4ISR solutions will integrate disparate systems and functions into coordinated operational capabilities.

### Information Dominance

Timely, relevant, and correct information can provide the decisive advantage over an enemy. Information dominance ensures that our warfighters can act with the best information at hand, while denying that advantage to the enemy.

replicate an operational environment unachievable in the commercial world. At SSC San Diego, the pieces of the overall C4ISR system can be integrated and tested in both laboratory and operational contexts.

Extensive fleet engineering services provide a full range of systems engineering, logistics, on-board installation, and maintenance and repair support.

SSC San Diego is well-positioned geographically to perform its mission. It is close to major operational commands of the air, surface, and submarine Navy; air, expeditionary, and electronic components of the Marine Corps; the amphibious forces; and the special forces.

The SPAWAR Systems Activity in Hawaii supports the Commander in Chief, U.S. Pacific Command; Commander in Chief, U.S. Pacific Fleet; and all other Navy/Marine Corps/joint commands throughout the central and western Pacific/Indian Ocean areas. The SPAWAR Systems Facilities in Guam and Japan support shore sites within their local areas and the ships of the Seventh Fleet.

# Capabilities



*SSC San Diego has superb capabilities—physical and virtual facilities and laboratories, distributed test beds, high-performance computers and networks, worldwide communications connectivity—for conducting RDT&E and providing life-cycle support in C4ISR. A few highlights:*

## Distributed Test Beds—Supporting integrated testing

C4ISR systems must link U.S. ships, aircraft, submarines, and land sites as well as theater, joint, allied, and coalition forces into an information network that supports our war-fighters. SSC San Diego test beds support integrated testing of multiple configurations involving components on a global scale. Connectivity for these distributed test beds is provided by integrated virtual networks using both military and commercial communications systems.

## C4ISR Systems Integration Environment—Enhancing battlespace capabilities for the warrior

The C4ISR Systems Integration Environment (C4ISR SIE) is the Navy's premier C4ISR integration and test facility. A distributed environment consisting of existing laboratory facilities, systems, and core personnel, the C4ISR SIE supports life-cycle acquisition, supports system integration and test, and assures cost-effective implementation of integrated, joint, and interoperable naval C4ISR systems.

## High-Performance Computing and Networking—Solving grand-challenge problems

SSC San Diego is a leader in Department of Defense (DoD) high-performance computing and networking (HPCN). The most recent addition to this capability is an upgrade to our high-bandwidth asynchronous transfer mode (ATM) campus

network system linking SSC San Diego and other DoD scientists and engineers with scalable, parallel computing systems. These systems and ATM links provide DoD employees with both classified and unclassified HPCN environments, enabling the solution of grand-challenge problems in SSC San Diego and other DoD mission areas.

## Command Center of the Future—Demonstrating future C4ISR capabilities

SSC San Diego's Command Center of the Future was designed and built to demonstrate, in a realistic context, future C4ISR capabilities. The center demonstrates a vision of the distributed collaboration process as it might be used in dealing with military operations or civilian natural disaster crises, or, in dealing with both simultaneously. Unique to the Command Center is the 3-D Volumetric Display System, which allows true three-dimensional visualization of images.

## Information Operations Center of Excellence—Bringing information warriors

together with concepts and technologies to excel in information operations. SSC San Diego's Information Operations Center of Excellence (IOCOE) was established to develop integrated strategies, concepts, and services; identify, assess, and demonstrate current and future technologies in an integrated, operationally valid environment; and provide a "neutral" technologically sophisticated environment for helping operators with policies and doctrine. A key component of the IOCOE will be the Information Operations Center of the Future, a flexible, modular facility able to incorporate emerging technologies, development programs, and real-world challenges into a common environment.



# Programs

*SSC San Diego participates in a broad range of programs to develop the functionality and capabilities—the connectivity, information access, collaboration tools, consistent situation understanding, and information protection—our Nation's warfighters require. Some highlights of our work in these areas follow.*

**Connectivity**—Providing assured, user-transparent connectivity, on demand, to any desired location

SSC San Diego is part of a cross-organizational team working on the Joint Maritime Communications Strategy (JMCOMS), which will provide high-capacity, flexible communications under the control of the warfighter. JMCOMS incorporates the latest advances in commercial and military communications technology to maximize bandwidth, enabling the sharing of information seamlessly, in real- or near real-time, through flexible, adaptive, and interoperable systems and services.

**Information Access**—Providing access to the right information at the right time

The Global Command and Control System–Maritime (GCCS–M), the primary afloat and ashore C4I system for the Navy, Marine Corps, and Coast Guard, is the maritime component of the first joint system to provide true interoperability among the services. It provides a foundation for Joint Vision 2010, whereby the key information needed to create and share a consistent understanding of the operational situation is available to all decision-makers. Much of the technology that makes this possible came from SSC San Diego's pioneering work in C4I systems architecture.

**Collaboration**—Enhancing the ability to collaborate in a multi-echelon, multi-force environment

SSC San Diego's Common Operational Modeling, Planning, and Simulation Strategy (COMPASS) project brings distributed collaborative planning and modeling and simulation services to a wide range of C4I systems at all command levels, providing interoperability among formerly incompatible

systems. COMPASS provides analysis, preview, and rehearsal capabilities to transform C4I systems, including mission planning systems, into collaborative planning, rehearsal, and training systems.

**Consistent Understanding**—Providing a consistent understanding of the operational situation

Consistent situation understanding requires sensors and systems to collect tactical data, provide data fusion capabilities, interpret the information/situation, and share the information as appropriate. SSC San Diego developments in unmanned systems, navigation systems, and a large variety of individual intelligence, surveillance, and reconnaissance sensors provide our warfighters with unprecedented capabilities for information dominance. Each comprises a system within the aggregate of C4ISR systems; each gives access to information needed for consistent situation understanding. SSC San Diego is at the forefront of developments to integrate the information from these systems into the tactical picture.

**Information Protection**—Protecting our information resources while denying our enemy the information needed to implement aggressive actions

Increasingly, adversaries can attack data within databases, computers, communications links, and sensors. The Intrusion Detection, Assessment, and Recovery program is an SSC San Diego–Naval Research Laboratory effort directed at developing decision aids to support prevention and reaction to information warfare attacks.

**Complementary Programs and Research**

In addition to our primary C4ISR focus, we are uniquely qualified to conduct programs in several other areas vital to the Navy: environmental quality technology/assessment, marine mammals, ocean engineering, and robotics and physical security. We also encourage our scientists and engineers to explore new ideas and conduct initial research through our Independent Research program.

*Looking forward into the next century, our overriding challenge is to provide the Nation's warfighters with the tools they need to achieve battlespace information dominance.*

*Optimal C4ISR is the key—  
SSC San Diego will provide that key.*

Reviewed and approved by

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